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DR. VON BUCHKA has been appointed the successor of Dr. Eugen Zell in the Imperial Board of Health, Berlin, and has qualified himself as privat-dozent in the University of Berlin. The subject of his inaugural lecture being 'The scientific basis of the newer development of analytic chemistry.'

DISCUSSION AND CORRESPONDENCE.

NOMENCLATURE OF METAMORPHIC LAVAS.

IN the gold belt of the Sierra Nevada there are two very distinct sets of lavas. One of these is Juratrias in age or older, and is separated by a marked unconformity from a later set of lavas, chiefly of Tertiary age. The older set of lavas has been metamorphosed in varying degrees, so that at some points their original nature is not evident. Even where little altered they almost universally contain secondary minerals, such as epidote, zoisite, chlorite, uralite and calcite. The general appearance of these rocks and their mineral composition is, therefore, very different from the corresponding set of Tertiary lavas.

It is, therefore, very confusing to the general public to use the same set of names for the two sets of rocks. In the gold-belt region the older series of lavas has been compressed and infolded with the Juratrias and older sediments, which are called the auriferous slate series, since they contain by far the larger portion of the gold-quartz veins of the Sierra Nevada.

In many other parts of the world there are similar broad distinctions to be made between an older and younger set of lavas. It is very important that some method should be devised by which one may designate the fact that any given lava originally corresponded to a given type and at the same time express the fact that it has undergone metamorphism. This has been done in specific cases in various parts of the world. Thus Dr. Bascom, with the rhyolites expresses by the prefix *apo* the fact that the rock, originally a glassy rhyolite, has undergone devitrification. The prefix *epi*- has also been used in some cases to express alteration. Thus the rocks called the epidiorite have been shown in many cases to have resulted from the alteration of diabase. The term metadiorite was used by Dana, and lately has been used by Cross and the writer, for diorites formed by the

alteration of other rocks, without reference to their original character. None of these terms has thus far been used in a general way to express alteration in all of the altered lavas.

Dr. Bascom writes concerning the three prefixes that have been mentioned, as follows:*

"The prepositions *meta*, *epi* and *apo*, as prefixes, all indicate some sort of an alteration. Their exact force has been thus defined by Professor Gildersleeve: '*Meta* indicates change of any sort, the nature of the change not specified.' This accords with the use of the prefix by Dana in such terms as 'metadiorite' and 'metadiabase.' These terms have been recently revived to designate rocks 'now similar in mineralogical composition and structure to certain igneous rocks, but derived by metamorphism from something else.' *Epi* signifies the production of one mineral *out of* and *upon* another. This prefix has not been much used. We find it in such terms as epidiorite, epigenetic hornblende and epistilbite. *Apo* may properly be used to indicate the derivation of one rock from another by some specific alteration."

It is evident that Professor Gildersleeve's definition, that the prefix *meta* is the most logical one to use to express, in a general way, the metamorphic condition of altered rocks. Probably if the term had not already been used in certain specific senses there would be no objection to its adoption for this purpose, and speaking of meta-andesites instead of porphyrites; of meta-basalts instead of melaphyres, of meta-rhyolites instead of quartz-porphyrries, and of meta-trachytes instead of orthophyres. This would express not only at once the fact that the rock was originally an andesite, basalt, rhyolite or trachyte, but also of the fact that it had undergone a metamorphism which would suggest the presence of the various secondary minerals which are almost always found in such altered lavas.

The adoption of this system of nomenclature is urged by the writer as a means of simplifying the very burdensome and unphilosophical series of names in use at the present time.

H. W. TURNER.

U. S. GEOLOGICAL SURVEY,
January, 1897.

* Journal of Geology, Vol. I., p. 827.